

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty) (PCT Article 36 and Rule 70)

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REC'D 06 JUN 2004
WIPO PCT

Applicant's or agent's file reference ITP 10.1	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US03/27651	International filing date (day/month/year) 03 September 2003 (03.09.2003)	Priority date (day/month/year) 07 October 2002 (07.10.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): C22B 34/12; C22C 1/04; B22F 9/28 and US Cl.: 75/ 351, 363, 368, 617, 619, 620		
Applicant INTERNATIONAL TITANIUM POWDER LLC		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input checked="" type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 07 April 2004 (07.04.2004)	Date of completion of this report 03 May 2005 (03.05.2005)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Roy V King Telephone No. 571-272-1700 <i>Jean Proctor</i> Paralegal Specialist

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US03/27651

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☒ the description:

pages 1-13 as originally filed/furnished

pages* NONE received by this Authority on _____

pages* NONE received by this Authority on _____

☒ the claims:

pages 14-24 as originally filed/furnished

pages* NONE as amended (together with any statement) under Article 19

pages* NONE received by this Authority on _____

pages* NONE received by this Authority on _____

☒ the drawings:

pages 1/4-4/4 as originally filed/furnished

pages* NONE received by this Authority on _____

pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs. _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs. _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application
- ☒ claims Nos. 28-59,71-79 and 81-84

because:

- ☐ the said international application, or the said claim Nos. _____ relate to the following subject matter which does not require an international preliminary examination (*specify*):

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____ are so unclear that no meaningful opinion could be formed (*specify*):

- ☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed.

- ☒ no international search report has been established for said claims Nos. 28-59,71-79 and 81-84

- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

- | | | |
|----------------------------|--------------------------|-----------------------------------|
| the written form | <input type="checkbox"/> | has not been furnished |
| | <input type="checkbox"/> | does not comply with the standard |
| the computer readable form | <input type="checkbox"/> | has not been furnished |
| | <input type="checkbox"/> | does not comply with the standard |

- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

- ☐ See Supplemental Box for further details.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US03/27651**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims <u>1-27, 60-70, 80</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-27, 63-68</u>	YES
	Claims <u>60-62, 69, 70, 80</u>	NO
Industrial Applicability (IA)	Claims <u>1-27, 60-70, 80</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)

Claims 60-62, 69, 70 and 80 lack an inventive step under PCT Article 33(3) as being obvious over Armstrong et al. (US 5958106). Armstrong et al. discloses an apparatus for producing titanium which includes a reactor where a mixture of titanium chloride and liquid alkali metal can react to form titanium products, a chamber where the products are cooled and separated from the reducing metal, and a separator for separating alkali metal halide from the formed products. The Armstrong et al. apparatus further includes a condenser as set forth in claims 61 and 62, i.e. note the heat exchangers and auxiliary separator shown in Figure 1 of Armstrong et al. The Armstrong et al. system includes a boiler as defined in present claim 69 (see Armstrong et al. Figure 1, drawing feature 22), and the product separator appears to be generally vertically oriented.

Armstrong et al. does not specify using the precise amount of reducing metal as set forth in present claim 60, and thus does not specify the precise products as defined in present claim 80 (which depends upon a process employing that precise amount). However, the apparatus as shown and described by Armstrong et al. appears to be fully functional using that amount of reducing metal. Further, the titanium products obtained in the Armstrong et al. process appear to be substantially identical to those which are produced in the presently claimed process. Therefore, the claimed invention cannot be said to define an inventive step in view of what is disclosed by Armstrong et al.

In a response filed 13 September 2004, Applicant states that the process of the present invention, particularly with respect to reductant metal being vaporized, is distinct from that as described by Armstrong et al. Assuming that Applicant is correct, such would not give rise to inventive step in present claims 60-62, 69 and 70 because these claims are directed to an apparatus, not a process, and as stated supra, all parts of the apparatus as claimed appear to be present in the disclosure of Armstrong et al. The reactants and relative amounts that may be used in such an apparatus, and any consequences occurring such as vaporizing of the reductant metal, are not relevant to consideration of inventive step in the apparatus. With respect to claim 80, Applicant states that the morphology of the product defined in this claim is different from that made by Armstrong et al., but points to no specific distinctions in the claimed products versus those made by the Armstrong et al. process.

Claims 1-23 and 63-68 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a process which produces sufficient heat to vaporize substantially all of the reducing metal as required by claims 1-27, nor does the prior art teach or fairly suggest an apparatus which includes the sweep gas flow path as required by claims 63-68. Claims 1-27, 60-70 and 80 meet the criteria set out in PCT Article 33(4), and thus possess industrial applicability because the subject matter claimed can be made or used in industry.